

DISPLACEMENT ANALYSIS:

WORK DONE BY LOAD: $W = \frac{1}{2} P\Delta$

STRAIN ENERGY OF THE TRUSS STRUCTURE: $U = \sum \frac{F_i^2 L_i}{2A_i E}$

∴ DEFLECTION Δ IN THE LOAD DIREC.: $\Delta = \frac{1}{P} \sum \frac{F_i^2 L_i}{A_i E}$

F_i - FORCES OF TRUSS MEMBERS.

A_i = CROSS-SECTİONAL AREA OF TRUSS i .

L_i = LENGTH OF TRUSS i .

E = YOUNG'S MODULUS OF TRUSS MATERIAL.

STEPS:

1. FIND ALL AXIAL TRUSS MEMBER FORCES. F_i

2. FIND ALL STRAIN ENERGY. U

3. FIND Δ USING U, P . P IS THE LOAD.

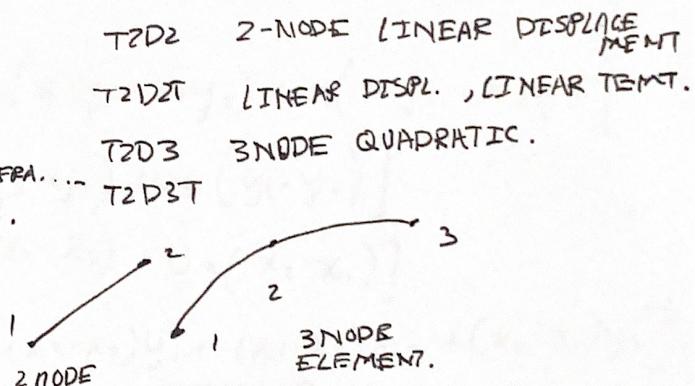
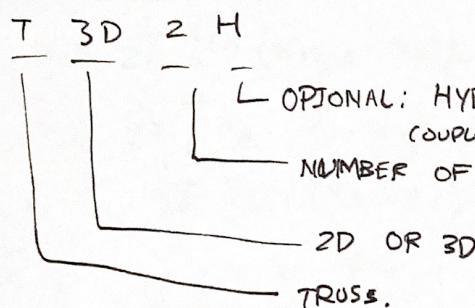
$$U = \sum \bar{U}_i \frac{L_i}{2E} ?$$

LIMITATIONS:

- ONLY SINGLE LOAD
- ONLY DISPLACEMENT IN LOADING DIRECTION CAN BE DETERMINED.

FEA - TRUSS:

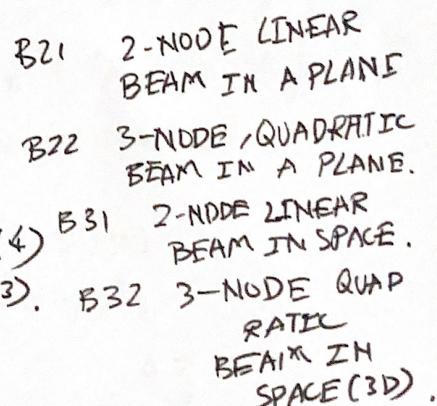
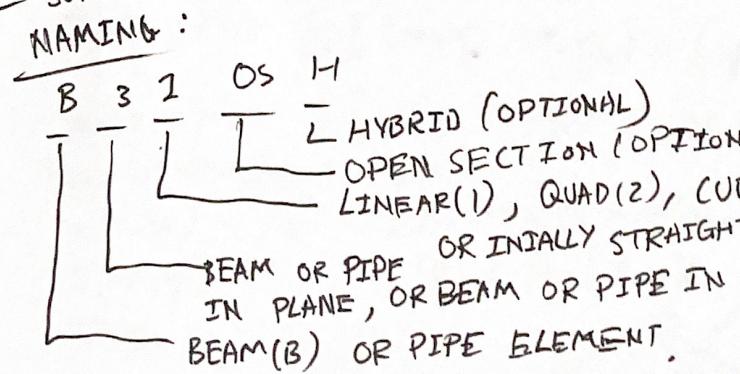
NAMING



FEA-BEAM:

- SUPPORT LOADINGS APPLIED PERPENDICULAR TO THEIR AXES.
- SUPPORT BENDING, TORSION AND AXIAL FORCES.

ABAQUS:



2-NODE
3-NODE